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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,811	03/18/2004	Tetsuji Sato	250645US2	5882

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/13/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/13/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/802,811

Applicant(s)

SATO, TETSUJI

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/13/06 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi et al., US 5,266,199.

Taniguchi et al. shows the invention as claimed including a vacuum processing apparatus comprising: a vacuum chamber 56d accommodating therein a substrate 1 to be processed, allowing an inner space of the vacuum chamber to be maintained at a vacuum level; a first structure 55 fixedly disposed at a location in the vacuum chamber; a second structure 50 installed in the vacuum chamber and facing the first structure, the second structure being vertically movable so as to vary a distance between the first

Art Unit: 1763

structure and the second structure; a driving mechanism for vertically moving the second structure, the driving mechanism being installed outside the vacuum chamber; a bellows unit 8d/8e/8f for airtightly sealing an opening, the bellows unit having an upper bellows portion 8d/8e, a lower bellows portion 8f, and a ring member 8c connected to the driving mechanism, wherein the opening, through which the second structure is driven by the driving mechanism from the outside of the vacuum chamber, is provided at the vacuum chamber, and the ring member is disposed between the upper bellows portion and the lower bellows portion; and a structure supporting member 7 for connecting the ring member to the second structure, the structure supporting member being installed in the vacuum chamber, wherein the upper bellows portion and the lower bellows portion are oppositely extended and contracted in accordance with a vertical movement of the ring member while maintaining a constant total length of the bellows unit (see, the entire document, especially fig. 2 and col. 5-line 64 to col. 9-line 44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoyoshi et al., US 2004/0035364 in view of Taniguchi et al., US 5,266,199.

Tomoyoshi et al. shows the invention substantially as claimed including a plasma processing apparatus comprising: a vacuum chamber 1/11 accommodating therein a substrate to be processed, allowing an inner space of the vacuum chamber to be maintained at a vacuum level; a first electrode 3/13 capable of being fixedly disposed at a location in the vacuum chamber; a second electrode 2/12 installed in the vacuum chamber and facing the first electrode, the second electrode being vertically movable so as to vary a distance between the first electrode and the second electrode; a driving mechanism for vertically moving the second electrode, the driving mechanism being installed outside the vacuum chamber; a bellows unit 7/17 for airtightly sealing an opening; and a high frequency power source 14/15 generating plasma between the first electrode and the second electrode (see, for example, figs. 1 and 6 and their descriptions).

Tomoyoshi et al. does not expressly disclose the claimed upper bellows/lower bellows/ring/supporting member structure. Taniguchi et al. discloses an apparatus including a bellows unit having an upper bellows portion 8d/8e, a lower bellows portion 8f, and a ring member 8c connected to a driving mechanism, wherein the opening, through which the second structure is driven by the driving mechanism from the outside of the vacuum chamber, is provided at the vacuum chamber, and the ring member is disposed between the upper bellows portion and the lower bellows portion, and a structure supporting member 7 for connecting the ring member to the second structure, the structure supporting member being installed in the vacuum chamber, wherein the upper bellows portion and the lower bellows portion are oppositely extended and

contracted in accordance with a vertical movement of the ring member while maintaining a constant total length of the bellows unit (see the entire document, especially the Summary of the Invention and fig. 2 and its description). Therefore, in view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Tomoyoshi et al. so as to comprise the claimed upper bellows/lower bellows/ring/ supporting member structure in order to provide a small-sized and inexpensive sealing mechanism for the processing apparatus that can reduce or remove the thrust/force applied to the substrate/electrode support moving structure.

With respect to claims 2 and 10, it would have been an obvious choice of design to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Tomoyoshi et al. modified by Taniguchi et al. as to have the lower electrode as the first fixed electrode and the upper electrode as the second movable electrode if movement of the upper electrode instead of the lower electrode is desired, and such limitation would not lend patentability to the instant application absent the showing of unexpected results.

Concerning claims 3-7 and 11-15, note that the upper electrode 3/13 of the apparatus of Tomoyoshi et al. is supported from underneath the lower electrode (by structures 1/11 and 9/19); the electrode supporting member includes an exhaust ring 8/18 for uniformly exhausting the vacuum chamber and a cylindrical member 9/19-20 for protecting an inner wall of the vacuum chamber.

Concerning claims 6-7 and 14-15, note that the apparatus of Tomoyoshi et al. in view of Taniguchi et al. further comprises a substrate supporting member for supporting the substrate to be processed above the lower electrode, wherein the substrate supporting member is vertically movable by the driving mechanism to pass through the lower electrode. With respect to claims 7 and 15, note that the distance between the first electrode and the second electrode in the apparatus of Tomoyoshi et al. modified by Taniguchi et al. is varied while constantly maintaining a volume of the vacuum chamber maintained in vacuum.

Claims 1-2 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshimizu, US 5,980,687 in view of Taniguchi et al., US 5,266,199.

Koshimizu shows the invention substantially as claimed including a plasma processing apparatus comprising: a vacuum chamber 102 accommodating therein a substrate W to be processed, allowing an inner space of the vacuum chamber to be maintained at a vacuum level; a first lower electrode 110 capable of being fixedly disposed at a location in the vacuum chamber; a second upper electrode 116 installed in the vacuum chamber and facing the first electrode, the second electrode being vertically movable so as to vary a distance between the first electrode and the second electrode; a driving mechanism 120 for vertically moving the second electrode, the driving mechanism being installed outside the vacuum chamber; a bellows unit 122 for airtightly sealing an opening; and a high frequency power source 130/134 generating

Art Unit: 1763

plasma between the first electrode and the second electrode (see figs. 1 and 3 and their descriptions).

Koshimizu does not expressly disclose the claimed upper bellows/lower bellows/ring/supporting member structure. Taniguchi et al. discloses an apparatus including a bellows unit having an upper bellows portion 8d/8e, a lower bellows portion 8f, and a ring member 8c connected to a driving mechanism, wherein the opening, through which the second structure is driven by the driving mechanism from the outside of the vacuum chamber, is provided at the vacuum chamber, and the ring member is disposed between the upper bellows portion and the lower bellows portion, and a structure supporting member 7 for connecting the ring member to the second structure, the structure supporting member being installed in the vacuum chamber, wherein the upper bellows portion and the lower bellows portion are oppositely extended and contracted in accordance with a vertical movement of the ring member while maintaining a constant total length of the bellows unit (see the entire document, especially the Summary of the Invention and fig. 2 and its description). Therefore, in view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Koshimizu so as to comprise the claimed upper bellows/lower bellows/ring/ supporting member structure in order to provide a small-sized and inexpensive sealing mechanism for the processing apparatus that can reduce or remove the thrust applied to the carrier shaft.

Claims 3-7 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshimizu, US 5,980,687 in view of Taniguchi et al., US 5,266,199 as applied to claims 1-2 and 9-10 above, and further in view of Kaminishizono et al., US 5,647,912 or Nishimoto et al., US 7,147,749 or Tomoyoshi et al., US 2004/0035364.

Koshimizu and Taniguchi et al. are applied as above but do not expressly disclose wherein the upper electrode is supported from underneath the lower electrode; and wherein the electrode supporting member includes an exhaust ring for uniformly exhausting the vacuum chamber and a cylindrical member for protecting an inner wall of the vacuum chamber. Kaminishizono et al. discloses an apparatus comprising a lower electrode and an upper electrode, wherein the upper electrode is supported from underneath the lower electrode, the electrode supporting member includes an exhaust ring 7 for uniformly exhausting the vacuum chamber and a cylindrical member 11 for protecting an inner wall of the vacuum chamber (see, for example, figs. 4-6 and their descriptions). Additionally, Nishimoto et al. discloses an apparatus comprising a lower electrode 30 and an upper electrode 22, wherein the upper electrode is supported from underneath the lower electrode, the electrode supporting member includes an exhaust ring 64 for uniformly exhausting the vacuum chamber and a cylindrical member 26 for protecting an inner wall of the vacuum chamber (see, for example, fig. 1 and its description). Additionally, Tomoyoshi et al. discloses an apparatus comprising a lower electrode 2/12 and an upper electrode 3/13, wherein the upper electrode is supported from underneath the lower electrode (by structures 1/11 and 9/19), the electrode supporting member includes an exhaust ring 8/18 for uniformly exhausting the vacuum

Art Unit: 1763

chamber and a cylindrical member 9/19-20 for protecting an inner wall of the vacuum chamber (see, for example, figs. 1 and 6, and their descriptions). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Koshimizu modified by Taniguchi et al. so as to have the claimed electrode support member in order to, for example, reduce contamination of the chamber walls, provide suitable support for the electrode, and uniformly exhaust gasses from the chamber.

Concerning claims 6-7 and 14-15, note that the apparatus of Koshimizu in view of Taniguichi et al. and Kaminishizono et al. or Nishimoto et al. or Tomoyoshi et al., further comprises a substrate supporting member for supporting the substrate to be processed above the lower electrode, wherein the substrate supporting member is vertically movable by the driving mechanism to pass through the lower electrode. With respect to claims 7 and 15, note that the distance between the first electrode and the second electrode in the apparatus of Koshimizu modified by Taniguchi et al. and further modified by Kaminishizono et al. or Nishimoto et al. is varied while constantly maintaining a volume of the vacuum chamber maintained in vacuum.

Response to Arguments

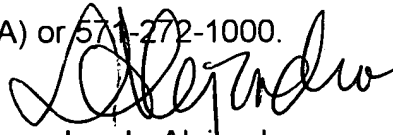
Applicant's arguments with respect to claims 1-7 and 9-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Luz L. Alejandro
Primary Examiner
Art Unit 1763

March 6, 2007